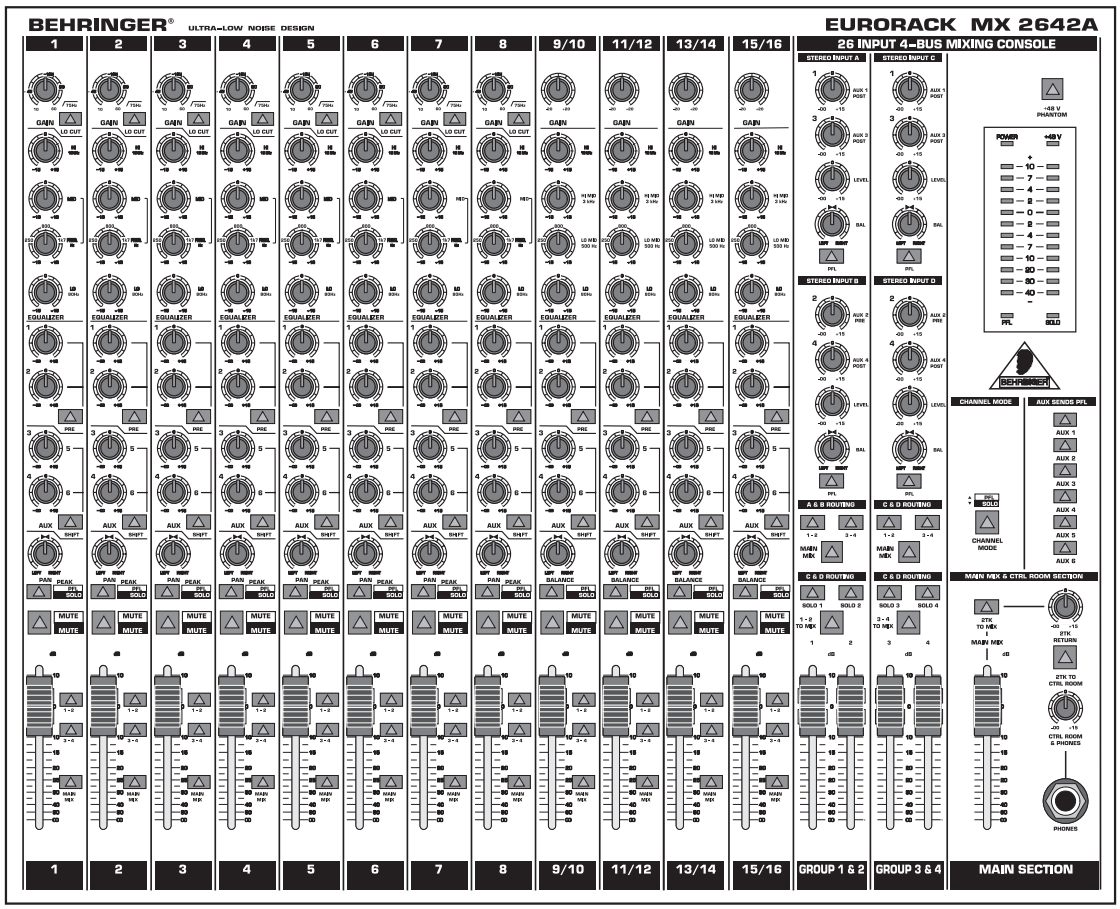
EURORACK® MX2642A

ENGLISH

User's Manual

Version 1.1 January 2001



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SAFETY INSTRUCTIONS

CAUTION: To reduce the risk of electrical shock, do not remove the cover (or back). No user serviceable parts inside; refer servicing to qualified personnel.

WARNING: To reduce the risk of fire or electrical shock, do not expose this appliance to rain or moisture.

This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltage inside the enclosure – voltage that may be sufficient to constitute a risk of shock.

This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Read the manual.

DETAILED SAFETY INSTRUCTIONS:
All the safety and operation instructions should be read before the appliance is operated.
Retain Instructions:
The safety and operating instructions should be retained for future reference.
Heed Warnings:
All warnings on the appliance and in the operating instructions should be adhered to.
Follow instructions:
All operation and user instructions should be followed.
Water and Moisture:
The appliance should not be used near water (e.g. near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool etc.).
Ventilation:
The appliance should be situated so that its location or position does not interfere with its proper ventilaton. For example, the appliance should not be situated on a bed, sofa rug, or similar surface that may block the ventilation openings: or placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.
Heat:
The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.
Power Source:
The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
Grounding or Polarization:
Precautions should be taken so that the grounding or polarization means of an appliance is not defeated.
Power-Cord Protection:
Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles and the point where they exit from the appliance.
Cleaning:
The appliance should be cleaned only as recommended by the manufacturer.
Non-use Periods:
The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
Object and Liquid Entry:
Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
Damage Requiring Service:
The appliance should be serviced by qualified service personnel when:
- the power supply cord or the plug has been damaged; or
- objects have fallen, or liquid has been spilled into the appliance; or
- the appliance has been exposed to rain; or
- the appliance does not appear to operate normally or exhibits a marked change in performance; or
- the appliance has been dropped, or the enclosure damaged.

Servicing:
The user should not attempt to service the appliance beyond that which is described in the Operating Instructions. All other servicing should be referred to qualified service personnel.

FOREWORD

Dear Customer,

Welcome to the team of EURORACK users and thank you very much for expressing your confidence in BEHRINGER products by purchasing the MX2642A.

It is one of my most pleasant tasks to write this letter to you, because it is the culmination of many months of hard work delivered by our engineering team to reach a very ambitious goal: making an outstanding device that will become a standard tool used by studios and P.A. companies. The task to design the MX2642A certainly meant a great deal of responsibility, which we assumed by focusing on you, the discerning user and musician. It also meant a lot of work and night shifts to accomplish this goal. But it was fun, too. Developing a product usually brings a lot of people together, and what a great feeling it is when everybody who participated in such a project can be proud of what we've achieved.

It is our philosophy to share our joy with you, because you are the most important member of the BEHRINGER family. With your highly competent suggestions for new products you've greatly contributed to shaping our company and making it successful. In return, we guarantee you uncompromising quality (manufactured under ISO9000 certified management system) as well as excellent technical and audio properties at an extremely affordable price. All of this will enable you to fully unfold your creativity without being hampered by budget constraints.

We are often asked how we are able to produce such high-grade devices at such unbelievably low prices. The answer is quite simple: it's you, our customers! Many satisfied customers mean large sales volumes enabling us to get better conditions of purchase for components, etc. Isn't it only fair to pass this benefit back to you? Because we know that your success is our success too!

I would like to thank all people whose help on "Project MX2642A" has made it all possible. Everybody has made very personal contributions, starting from the designers of the unit via the many staff members in our company to you, the user of BEHRINGER products.

My friends, it's been worth the trouble!

Thank you very much,

Uli Behringer

EURORACK®

Professional 26-Input 4-Bus Mixing Console

- ▲ Ultra low-noise 26-channel 4-bus mixer with assignable subgroups
- ▲ Extremely high headroom – offering more dynamic range
- ▲ 4 assignable subgroups for multitracking / mixing
- ▲ 8 mono input channels with insert points and direct outputs
- ▲ Ultra low-noise discrete mic preamps with +48 V phantom power
- ▲ 4 stereo input channels
- ▲ 4 additional multifunctional stereo line inputs with aux sends
- ▲ 6 aux sends, with aux 1 & 2 switchable pre-/post fader
- ▲ Ultra-musical 4-band EQ on stereo channels
- ▲ Parametric midrange EQ and switchable Low-Cut filter on mono channels
- ▲ Balanced inputs and outputs
- ▲ Solo-In-Place and Pre-Fader-Listen function
- ▲ Separate mix and monitor / headphones outputs with insert points on mix outputs
- ▲ 2-track inputs assignable to main mix or monitor / headphones outputs
- ▲ High-quality 60 mm laser-trimmed faders and sealed potentiometers by ALPS
- ▲ State-of-the-art 4580 ICs and high quality components ensure crystal-clear audio performance and excellent noise figures
- ▲ Moveable connector panel for table-top or rack mounting
- ▲ Rugged construction ensures long life even under the most demanding conditions
- ▲ Manufactured under ISO9000 certified management system

MX2642A

TABLE OF CONTENT

1. THE MANUAL

Congratulations! In purchasing our EURORACK MX2642A you have acquired a mixer whose small size belies its incredible versatility and superlative audio performance. Your EURORACK is built to the same outstanding quality as our top-of-the range console, the BEHRINGER EURODESK MX9000.

The MX2642A offers you a choice of mono and stereo input channels, four assignable subgroups, and four stereo line inputs.

☞ **This manual first describes the terminology used, so that you can fully understand the MX2642A and its functions. Please read the manual carefully and keep it for future reference.**

Your EURORACK was carefully packed in the factory and the packaging is designed to protect the unit from rough handling. Nevertheless, we recommend that you carefully examine the packaging and its contents for any signs of physical damage, which may have occurred during transit.

☞ **If the unit is damaged, please do not return it to BEHRINGER, but notify your dealer and the shipping company immediately, otherwise claims for damage or replacement may not be granted. Shipping claims must be made by the consignee.**

☞ **Please make sure that all units have a proper ground connection. For your own safety, it is advisable not to remove the ground connection within the units or at the supply, or fail to make this connection at all. Please make sure that your local voltage matches the voltage required by the unit (as indicated on top of your PSU).**

☞ **Please note that both PSU and EURORACK will heat up during operation. This is completely normal and does not indicate a malfunction.**

1.1 Nomenclature

Most specialist subjects are not really all that difficult provided you understand the language used, and the vocabulary of mixing is pretty straight-forward. Nevertheless it is as well to be clear about what certain terms mean. A “slot” in a recorder will always be referred to as a track, while that in a mixer will invariably be a channel. We will attempt to be as unambiguous as possible with terms, since much confusion can arise from sloppy definitions.

1.2 Keys

At the end of this manual you will find some pages with drawings showing the front and rear panel of your EURORACK respectively. Keep them turned over, lying to the left of the text pages, while studying the manual.

All functions will be numbered consistently throughout the manual, whether they be in the text or on an illustration. In addition the following prefixes will be used to denote the various types of function control in any text respectively:

Prefix	Meaning
S	Switch
L	LED
P	Potentiometer
F	Fader

Tab. 1.1: Prefixes and their meaning

After every prefix, you will find the function number.

2. EURORACK OVERVIEW

The configuration is 26 into 4 into 2. This means that there are 26 inputs in total (8 mono and 4 stereo channels, 4 stereo line inputs, and an extra 2-track stereo input which can also be routed to the main mix. 2 stereo (or 4 mono) subgroups are provided for connecting to multitrack tape recorders, or for use as an aid during mixdown or a live concert mix.

2.1 Architecture

Mono Input Channels

Channels 1 - 8 are mono, with a choice of balanced mic or line inputs. The vintage-style high-current discrete mic amps are of the same incredible quality as those found on the acclaimed BEHRINGER EURODESK MX9000, while a large external power supply ensures low noise and superior transient response at all times. Insert points and direct outputs are also provided, giving “big console” functionality to the mono input channels.

Stereo Input Channels

A further 8 line inputs on the MX2642A are configured as 4 stereo input channels, accepting line level signals at -10 dBV (semi-pro) as well as at +4 dBu (professional) operating levels. These are ideal for multitrack tape returns, or for accepting outputs from MIDI and other electronic instruments.

Channel Outputs

A high-quality true-logarithmic 60 mm fader feeds the main via a constant-power channel PANORAMA control.

On your MX2642A, subgroup buses are fed via SUBGROUP and MIX ASSIGN switches, too. Here the channel PANORAMA control also selects between odd and even-numbered subgroup buses.

Subgroups

For ease and flexibility of mixing, four mono (two stereo) assignable subgroups are provided on your MX2642A.

Aux Sends

There are six aux send buses on the MX2642A, each with PFL.

Stereo Line Inputs

Four stereo line inputs, each with Solo/PFL, lie above the subgroup faders. These inputs are each assigned to two aux send buses. When these are used for returning tape tracks, these aux sends could be used as cue feeds to the performers’ headphones, or as effects sends for “wet” monitoring. Alternatively, the stereo line inputs could be used for MIDI instruments etc.

Main Mix Output

Main mix output level is via a high-quality true-log 60 mm stereo fader, and is monitored by a pair of accurate 12 segment bargraph peak meters, surrounded by four status LED’s. Other functions of the main section include headphones output with gain, and a 2-track tape return, which doubles as an extra stereo line input available to the mix with its own level control, completing the 26 input channels of the innovative MX2642A.

2.2 Metering

Channels 1 - 8 on your MX2642A have overload LED’s, while the L and R outputs have 12 segment bargraph meters. The L/R meters double up as mono PFL or stereo solo meters.

☞ **The master bargraph meters should average around 0 dB during loud passages. If they read persistently higher, or are peaking above +10 dB (top segment of the main L/R LED display), reduce either the main L/R fader, the subgroup faders and/or channel faders, or (as a last resort) channel input gain. Maybe it’s time to do a round of PFL metering.**

2.3 PSU (Power Supply Unit)

Any amplifier circuit is limited in its transient response by the available current. Every mixer has numerous line level operational amplifiers (op-amps) inside. When being driven hard, many desks begin to show signs of stress due to power supply limitations. Not so with the EURORACK. The sound will always stay clean and crisp right up to the operating limits of the op-amps themselves, thanks to our generous 40 W external power supply unit.

☞ **Do not connect the PSU to the EURORACK while the PSU is connected to the mains.**

3. MONO INPUT CHANNEL

Each channel comes with a balanced line input on 1/4" jack, and an XLR mic input. Phantom powering is switchable from the master panel (S36). The gain circuit has an unusually wide range from -50 dB to +10 dB, obviating the need for mic/line switching. The crucial operating levels -10 dBV and +4 dBu are clearly and accurately legended (P1).

3.1 Input Level Setting

Channel input level is determined by the GAIN control (P1). Use Solo/PFL (S14) to bring the channel input onto the left and right bargraph meters respectively. This also sends the Solo/PFL-ed signal to the left and right speakers.

☞ **For level setting (as opposed to localized listening) choose to use the mono PFL bus rather than the post-fader (post-channel pan) stereo solo bus (CHANNEL MODE global switch S37 up). Solo/PFL never interrupts the mix at the main recording outputs. It follows that aux sends and subgroups must also be unaffected, since they contribute directly to the main mix.**

In addition to switchable Solo/PFL (S14) metering, a channel LED (L15) illuminates when a channel is going into overload. This takes its cue from three test points: Input, post-EQ and post-fader. This is very important, especially when using extreme EQ settings or using a dynamics processor in an insert. In all cases the higher level wins. You do not want the overload light to come on except very intermittently during a take or a mix. If it does light persistently, reduce input gain. There is a steep Lo Cut (High Pass) filter (S2), slope @ 18 dB/Oct, -3 dB @ 75 Hz, for reducing floor rumble, explosives, woolly bottom end etc.

3.2 Equalizer

All mono input channels are fitted with three-band EQ and a switchable Lo Cut filter for eliminating unwanted subsonics. All three bands have up to 15 dB of cut and boost, with a centre detent for “off”.

The upper (P3) and lower (P6) shelving controls have their frequencies fixed at 12 kHz and 80 Hz respectively. The midrange (P4) control is semi-parametric with a peaking response. Q fixed at 1 octave, sweepable from 100 Hz - 8 kHz (P5).

3.3 Aux Sends

All aux sends are mono and post-EQ. For aux sends 1 & 2, two dedicated pots (P7, P8) are used. These can be taken from a point before or after the channel fader, i.e. pre or post (S9).

Aux sends 3 & 5, and 4 & 6 are serviced by two potentiometers (P10, P11). The SHIFT button (S12) determines whether buses 3 and 4 or 5 and 6 are addressed. Aux sends 3/4/5/6 are always wired post-fader.

For almost all FX send purposes, you will want aux sends to be post-fader so that when a fader level is adjusted, any reverb send from that channel follows the fader. Otherwise, when the fader is pulled down, the reverb from that channel would still be audible. For cueing purposes, aux sends will usually be set pre-fader. i.e. independent of the channel fader and mute.

☞ **Most reverbs etc. sum internally the left and right inputs. The very few that don’t may be driven in true stereo by using 2 aux sends.**

There is +15 dB of gain on every aux send. Such a high boost is usually only appropriate where the channel fader is set around -15 dB or lower. Here, an almost exclusively “wet” signal will be heard. In most consoles, such a wet mix requires the use of a pre-setting for the channel aux send, losing fader control. With the EURORACK you can have a virtually wet mix with fader control.

3.4 Routing, Fading and Muting

Routing means selecting which bus you want a channel to address. There are 3 stereo buses in the EURORACK MX2642A (plus a stereo solo bus). The main L/R bus is selected by S20, while the subgroups are selected by 1-2 and 3-4 assign switches (S18, S19). All 4 stereo buses follow channel PANORAMA (P13). Usually, only one of L/R, 1-2 or 3-4 will be selected for a particular channel.

☞ **An exception to this rule is when laying down voice takes. It is often convenient to have the mic channel(s) routed to all potential take tracks simultaneously, since you are often dropping in quickly between four or more tracks. It means one less button press each time you switch tracks.**

Level to the main L/R bus and to the group buses is ultimately determined by the channel faders (F17). These are designed to give a smooth logarithmic taper of a type more usually associated with megabuck consoles. The low level performance particularly is far smoother than that of a normal “budget” fader.

Channel PANORAMA (P13) positions the output of the channel in the stereo field. Its constant-power design ensures there are no level discrepancies whether a signal is hard-panned, centre-stage, or somewhere in-between. Such pin-point accuracy will be a revelation if you have been working on consoles with lower quality circuits.

Solo/PFL we encountered in section 3.1. Solo also follows channel PANORAMA.

The MUTE button (S16) is ergonomicaliy placed immediately above the channel fader. Engaging MUTE, indicated by L16, is equivalent to setting a fader level of minus infinity.

4. STEREO INPUT CHANNEL

Each stereo channel comes with two balanced line level inputs on 1/4" TRS jacks, for left and right signals, When only the left input is connected, the channel operates in mono.

4.1 Input Level Setting

Channel input sensitivity is adjustable within a +/- 20 dB gain range (P22), enabling a perfect match with most common sources including multitrack tape outputs, MIDI and other electronic instruments, and effects units, all of which are normally designed to operate at -10 dBV (semi-pro) and/or +4 dBu (pro) operating levels.

4.2 Equalizer

The stereo input channels are fitted with four-band EQ. The upper (P3), high midrange (P23), low midrange (P23a) and lower (P6) shelving controls have their frequencies fixed at 12 kHz, 3 kHz, 500 Hz and 80 Hz respectively.

All bands have up to +/- 15 dB of cut and boost, with a centre detent for “off”.

The EQ on the stereo channels is in principle identical to that on mono channels, except that the EQ is stereo, of course!

☞ **A stereo equalizer is generally preferable to using two mono equalizers when EQ-ing a stereo signal, as often discrepancies between left and right settings can occur.**

4.3 Aux Sends

These are the same as for mono channels (see 3.3). Note that a mono sum is taken from the stereo input.

4.4 Routing

The only difference here from the mono channel described in 3.4 is in the implementation of the BALANCE control. When a channel is run in stereo, this control functions as a BALANCE control, determining the relative balance of the left and right channel signals being sent to the left and right main mix buses (or maybe odd and even group buses). For example, with the BALANCE control turned fully clockwise, only the right portion of the channel's stereo signal will be routed to the main mix or to any or all of buses chosen.

5. SUBGROUPS, DIRECT OUTPUTS AND INSERTS

5.1 Subgroups

The principal routes to multitrack are via the subgroup outputs. There are 2 stereo (or 4 mono) subgroups. All channels can access all of them. Subgroup level is determined by the subgroup faders (F67, F68). PFL is supported (S33, S34).

Subgroups outputs can also be assigned to the main mix in pairs during mixdown (S35). If you want to run a subgroup in mono, it should not be fed into the main mix by the MAIN MIX switch (S35). Rather it should be brought back on a mono channel (or via e.g. a BEHRINGER ULTRALINK PRO MX882) so that it can be panned.

If you want to insert a dynamics processor between any of the four subgroups and the main mix, the group output should be used as a send, return being effected through another desk input. Here, remember to de-assign the subgroup pair from the main mix (S35).

The 2-track stereo input is particularly suitable for returning processed subgroup signals. Since this input cannot be routed back to any subgroup, a feedback loop is impossible. Four subgroup returns may easily be blended in stereo into this input simply by using the BEHRINGER ULTRALINK PRO MX882, greatly extending the functionality of your EURORACK.

Try inserting compression / de-essing / an exciter / a gate across grouped signals (e.g. backing vocals, drums, layered synths).

Try merging a dry signal with a little wet, then compressing the sum heavily. Though the reverb proportion wilt be low when a signal is present, the resultant reverb tail pumped up by the compressor during pauses in programme material will give the illusion that the reverb was massive all the time. (The listener wilt be left wondering how the singer could sound so clear in such a wet acoustic!)

5.2 Multitracking

The principal routes to multitrack are via the main mix and mic channel direct outputs. You can also use any of the aux outputs to send to tape.

5.3 Direct Outputs

Each mono channel on your EURORACK has its own direct output, which is taken from a point immediately after the fader (i.e. post EQ and after the aux sends). This can feed a tape track directly, enabling up to 14 tracks to be recorded simultaneously when using the aux sends to send to tape, without having to resort to using the subgroups). Direct outputs to tape provide the shortest possible recording signal path, and therefore highest fidelity.

5.4 Inserts

Insert points are useful for adding dynamic processing or equalization to a channel, the main mix or a group. Unlike reverbs etc., which are usually added to the dry signal, dynamic processing is normally applied across an entire signal. Here an aux send would be inappropriate. Instead the signal is intercepted somewhere along the channel, fed through the dynamics processor and/or EQ, then returned to the console at the same point where it left. The insert point is normalized, i.e. the signal is only interrupted when a jack is plugged into it.

All mono input channels have got insert points, as has the main mix. Each insert point is accommodated on a single TRS jack socket wired tip = send, ring = return, sleeve = ground/ screen. Inserts are always pre-fader, and also Pre-EQ/aux sends for channels.

☞ **Insert points may also be used as pre-EQ direct outputs without interrupting the signal flow. You can extend the functionality of your insert points by wiring them onto a jackfield patchbay, where send and return can be accessed on separate sockets.**

Inserting into a stereo channel or stereo line input

If you want to insert a dynamics processor etc. into any stereo input, it must be done between the source output and the EURORACK input, as these channels have no bona-fide insert point.

Post-EQ channel insert

If you want to insert a dynamics processor post-EQ, the direct output should be used as a send, return being effected though another desk channel, or possibly via a separate line mixer (such as the BEHRINGER ULTRALINK PRO MX882), patched into e.g. the 2-track or any other suitable stereo return channel.

☞ **In this arrangement you might find that compression tends to soften the perceived amount of (especially treble) EQ applied. The solution? Apply more EQ. This creates a real “pressure” sound, great for high energy music such as dance.**

6. MAIN SECTION

6.1 Aux Sends

These are on 1/4" balanced jacks at +4 dBu. No master aux send level pots are provided. However, you can use the input level control of your effects unit to match the output level from the EURORACK. If your effects unit does not have an input gain, then remember that every channel and aux send has up to 15 dB gain, which should be more than enough to drive any effects unit. All aux sends have a PFL facility (S38 - 43) to check that the aux send buses are being comfortably driven from the input channels and subgroups.

6.2 Stereo Line Inputs

There are four stereo aux line inputs: A, B, C and D. These operate in mono if only the left channel socket has a jack connected.

Each has LEVEL (P27), BALANCE (P28), and PFL (S29). These line inputs have been cleverly designed to be multi-functional as described below.

The stereo line inputs can be sent to two of the aux send buses (auxes 1 and 3 in the cases of A and C, and auxes 2 and 4 in the cases of B and D).

Tape Monitor Returns

You could use the stereo line inputs as tape returns from a multitrack recorder.

You might want to feed tape tracks into the artists headphones. Using aux sends 1 or 2 as a cue feed you can do this. You might want to “wet monitor”. Using aux sends 3 or 4 you can add reverb or echo without tying up a main desk channel.

Instrument Inputs

The stereo line inputs may be used as extra instrument inputs, especially if your MIDI keyboard or rack supplies a pre-mixed stereo signal.

When using the stereo line inputs as extra instrument inputs, you have access to the aux buses for effects processing.

Effects (Aux) Returns

The stereo line inputs may be used for returning the outputs of effects units.

Often it is useful to be able to send an effect into another effect. Echo sounds fatter when put through a stereo chorus or phaser. To do this use the aux send facility of the stereo line inputs. Just be sure not to send to an effect from its own output, creating feedback.

Certain stereo effects produce a perceived imbalance between the left and right channel levels.

When applying short left and right delays, the shortest one will always seem loudest. When pitch shifting up and down in wide stereo to thicken a sound, the signal shifted upwards will seem louder than one that goes down. In both cases use the BALANCE control (P28) to compensate.

☞ **When carrying any stereo imaging exercise, don't just rely on the control room monitors. Get a pair of headphones and listen in stereo and in reverse stereo, just in case you have any significant hearing discrepancies between your ears (and if you are in the habit of listening to high sound pressure levels (SPL's), chances are you will).**

Sometimes an engineer wants to narrow the stereo width of a reverb field. To do this you will have to come back on two mono channels to get independent PAN for the left and right signals.

Each of A + B and C + D is assignable to all or any of main mix (S32), or subgroup pairs 1+2 and 3+4 (S30, S31). Normally these will be assigned only to the main mix. However, provision is made for routing to the subgroups, in case you want to record the signal to tape, or mixdown via a subgroup.

6.3 Metering

Main mix/Solo/PFL level is displayed on a pair of highly-accurate 12 segment bargraph peak meters. LED's indicate Power on (top left), +48 V phantom power present (top right), and whether the mono pre-fader listen bus (bottom left) or the stereo solo bus (bottom right) is engaged.

6.4 CHANNEL MODE

The CHANNEL MODE switch (S37) determines whether solo-in-place or pre-fader listen is assigned to the channel solo buttons.

SOLO

Solo is short for solo-in-place, and is the preferred method for auditioning an isolated signal, or group of signals. Whenever a SOLO button is pressed, all unselected channels are muted in the monitors. Stereo panning is maintained. The solo bus is derived from the output of the channel pans, aux sends, stereo line inputs and subgroups, too. The solo bus is always post-fader.

PFL

Pressing S37 once disengages the stereo solo bus, and replaces it with a separate mono PFL (pre-fader listen) bus. Now any channel which is solo-ed, isn't. It is PFL-ed instead. PFL should always be used for gain-setting.

6.5 2-Track Input and Output

Input

The 2-track input is on balanced 1/4" TRS jacks at +4 dBu, and is primarily for auditioning mix playback from tape. S46 routes this signal to the monitors. However, it can also be routed to the main mix via S44. Here S46 should be disengaged, or you will be listening to the 2-track signal twice over! With S44 depressed you have another stereo line input available to the mix, suitable for accepting the output of a second EURORACK or the BEHRINGER ULTRALINK PRO MX882. With the LEVEL control (P45) fully clockwise, your 2-track input will be matched to the semi-professional level -10 dBV. For higher output recording sources (eg. +4 dBu) turn the level of P45 down.

Output

A single pair of balanced jacks deliver the mix output to your 2-track recorder (or PA system) at +4 dBu. Level to tape is ultimately determined by a precision stereo fader (F77). A mix insert point is provided for patching a gate, compressor etc. pre-fader.

☞ **Connecting a compressor or gate after the 2-track output would disrupt any attempt at a smooth fade using the output fader (F77). Although the 2-track output is primarily designed for recording, it can also be used as a PA feed, or as a send to the input of your sampler.**

6.6 Monitoring

A single volume control sends the level to the headphones and main monitors (P47).

The L/R meters follow whatever source is being auditioned (the meters won't make much sense if more than one source is selected!)

Selecting Solo/PFL (or monitoring a source other than the main mix) does not affect the signal from the L/R recording outputs. Just as well, or every time you wanted to do a quick solo during a mix, you'd have to start again!

Though most of you will want to audition the main mix most of the time there are exceptions. These include Solo/PFL of course, and also 2-track (or other external source) playback. The 2-track input could be "normalled" to a hi-fi pre-amp, allowing you to monitor extra sources such as vinyl, cassette, CD etc.

7. CONNECTIONS

7.1 Relocating the Connector Panel

A moveable panel houses all connection sockets to the EURORACK, except that to headphones. The EURORACK comes supplied with this panel fixed to the rear of the unit, ready for flat-mounting the console. If you want to rack mount your EURORACK, you will probably want to re-locate the connector panel to a more convenient site on the underside of the chassis.

- ▲ Lay the EURORACK on a soft surface, face down. Take care not to apply excessive pressure to the console during the following procedures. You will need a cross-head screwdriver to effect this manoeuvre.
- ▲ A blank panel on the underside of the chassis covers the recess where the connector panel is to be re-located. Remove the screws which are fixing this blank panel to the sides of the EURORACK chassis.
- ▲ Next remove the screws fixing the cover panel to the base of the EURORACK.
- ▲ Turn your attention to the rear panel, where the connector panel is currently sited. Remove the screws that fix this connector panel to the upper edge of the EURORACK.
- ▲ Now loosen (do not yet remove!) the screws fixing this connector panel to the to the sides or the EURORACK chassis. While you support the weight of the connector panel with one hand, remove the loosened screws with the other.
- ▲ Carefully manoeuvre the connector panel into its new location, taking care not to snag or strain any of the ribbon cables that connect it to the rest of the console's circuitry. The bottom edge of the connector panel should now rest on a flange at the base of the chassis.
- ▲ Loosely fit the screws that will fix the connector panel to the EURORACK's sides.
- ▲ Now fit the cover plate into its new location on the back of the EURORACK. The folded edge of the cover plate always faces the right-angled edge between the base and back of the EURORACK.
- ▲ Loosely fit the screws that fix the cover plate to the rear of the chassis, and the ones that complete the mounting of the connector panel on the underside.
- ▲ Once you are satisfied that both panels are properly seated and all screws are on the correct locations, tighten up all screws. Do not force any screw. Check that you have aligned the panels correctly if any seem too tight.

The entire procedure may be reversed at any time.

7.2 Connectors

You will need a lot of cables for different purposes. Make sure you got the right ones.

All outputs (except direct outputs and insert point sends) are ground-compensated (decoupled from the mains supply earth) to eliminate the possibility of ground loops.

Unbalanced equipment may be connected to balanced inputs/outputs. Either use mono 1/4" jacks or connect ring and barrel of TRS jacks (or pin 1 and 3 of XLR plugs).

Phantom power (+48 V DC) is provided. This can be switched on or off by the +48 V PHANTOM switch (S36).

☞ **Care should be taken NOT to plug mics into the console (or stagebox) while the phantom power is on. Also, mute the monitor/PA speakers when turning phantom power on or off. Allow 1 minute after powering up for the system to equilibrate before setting input gains.**

☞ **Please note that all units must be grounded properly. For your own safety, you should never remove any ground connectors from electrical devices or power cords or render them inoperative.**

☞ **Please ensure that only qualified personnel install and operate the MX2642A. During installation and operation the user must have sufficient electrical contact to earth. Electrostatic charges might affect the operation of the unit.**

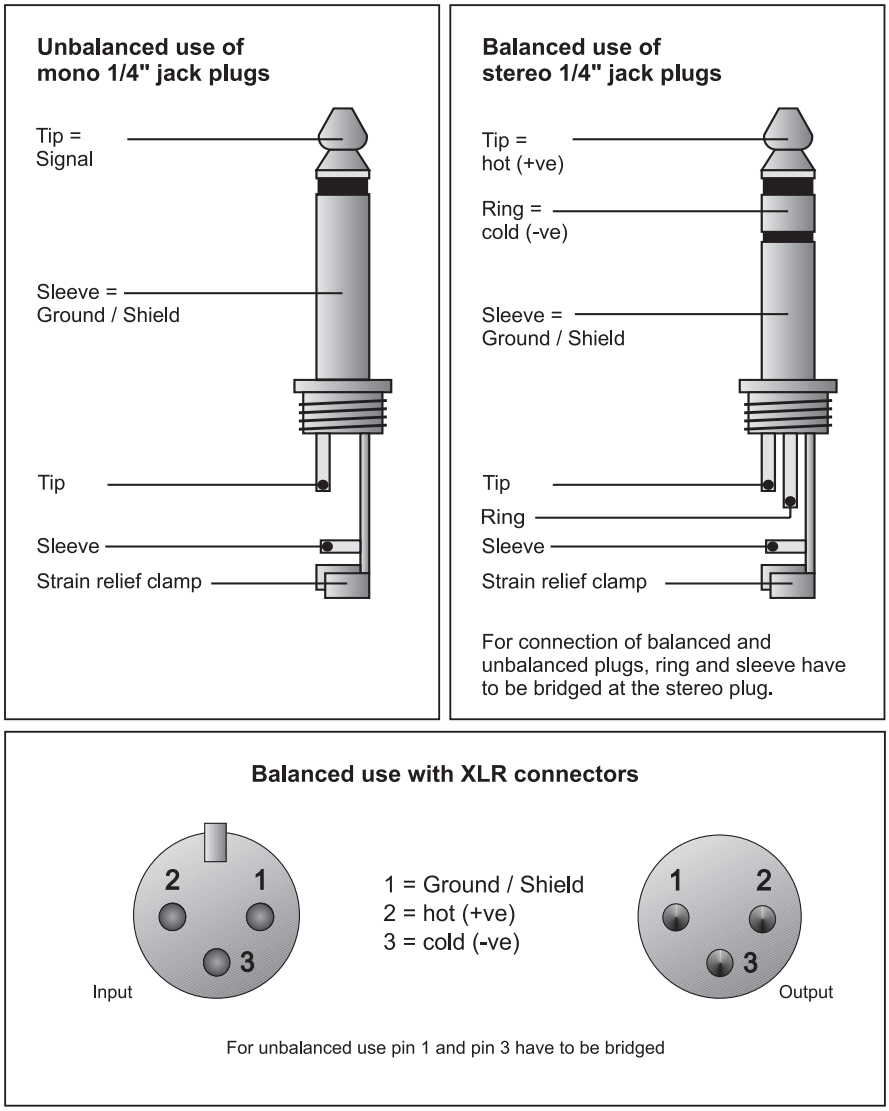

Fig. 7.1: Different plug types

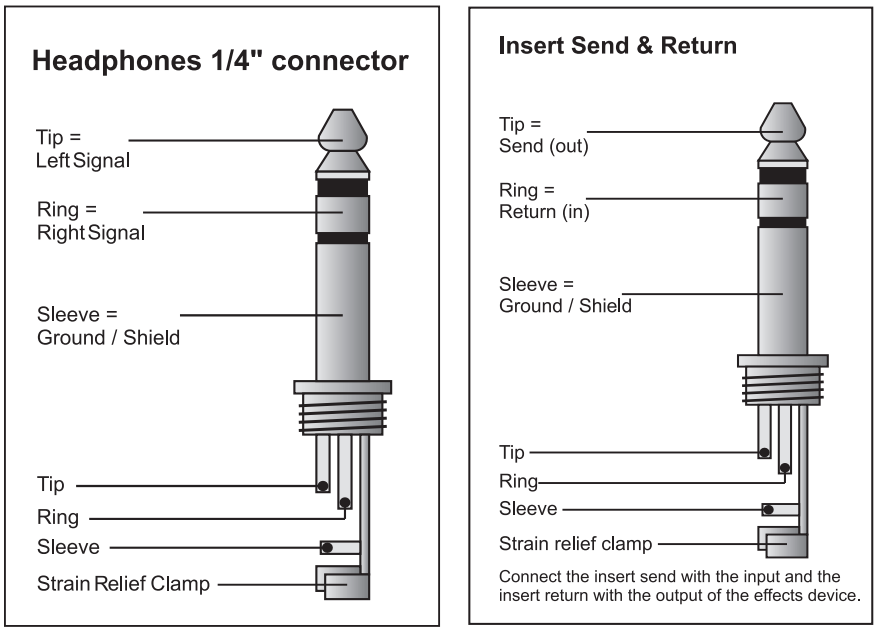

Fig. 7.2: Headphones connector / insert send & return connector

8. SETTING UP

8.1 Selecting Inputs

1) Mono channels accept mic or line inputs. If you are using the mic input, make sure nothing is connected to the line input (and vice-versa).

☞ **The mic inputs are more sensitive than the line inputs. Do not connect mics with phantom power switched on. NEVER use unbalanced mic cables with the phantom power switched on ever! Shorting +48 V to earth can cause serious damage.**

2) Stereo channels accept -10 dBV or +4 dBu line level signals. Any stereo channel can be run in mono simply by connecting into the left jack socket only. These channels are suitable for a variety of line-level sources including MIDI instruments and tape returns from multitrack.

3) Stereo line inputs are primarily designed for returning effects units, though these too may be given over to multitrack returns or MIDI instrument outputs.

8.2 Initializing Channels for Gain-Setting

1) Set gain to minimum and all aux sends to “Off” (fully counterclockwise).

2) Set EQ to flat (all knobs at 12 o’clock).

3) Where applicable, set Lo Cut switch (S2) “On” for most mics, “Off” for signals with desired very low frequency content.

4) Set channel mode to PFL (S37 up).

5) Depress SOLO/PFL (S14) switch.

8.3 Auditioning a Signal and Setting up a Channel

1) Make a typical noise, or roll the tape. There should also be some activity at the main L/R bargraph meters, indicating the PFL level.

2) For Mic/Line inputs: Adjust the GAIN control (P1) until transient peaks are regularly hitting +6 dB. Continuous signals should not exceed 0 dB.

3) For stereo line inputs: Adjust the GAIN control (P22) until transient peaks are regularly hitting +6 dB. Continuous signals should not exceed 0 dB.

4) If EQ is used, repeat steps 8.2 1) & 2).

5) If an insert is used to patch in a compressor, gate, EQ etc, use the outboard processor’s bypass or effect “Off” switch to A/B monitor the effect. If it does not have a bypass switch or equivalent, you will have to keep connecting and disconnecting the device until you complete the following procedure: Adjust the processor’s output level so that effected and bypassed signals are of comparable level, ie “unity” gain.

6) SOLO/PFL switch (S14) up. Move onto next channel.

8.4 Desk Normalization

All board settings should be set to the normal default condition before or after every session. Usually faders are set to zero (minus infinity) EQ’s set flat and switched out, trimpots and channel aux sends turned fully counterclockwise etc. Many controls have a natural initial setting. For EQ cut and boost this is centre position. However, some settings, such as selecting pre or post for channel aux sends, will depend on the operating environment (e.g. studio or live), or on a particular engineer’s preferred way of working.

8.5 Multitrack Initialization

Set up the multitrack so that any track in “record ready” condition has its input monitored when the tape is stationary. Place all tracks to be recorded into “record ready” status. (Once a recording has been made, these tracks should automatically switch to tape playback.) Check that the input levels to each track are optimized before recording commences.

8.6 Recording Levels

When recording to digital, it's a good idea to keep the recorder's peak meters below 0 dB. Most (not all, esp. samplers) read 0 dB with some headroom left. This is because, unlike with analogue, the onset of digital distortion is as sudden as it is horrible. If you really want to take your recording level to the limit (and fully exploit 16-bit digital's 96 dB dynamic range), you'll have to do some calibrating. How to do it? Well, you could run a tone at 0 dB from the mixer and use that as your DAT or ADAT reference. But your DAT or ADAT may be way under its maximum input limit. Probably a better way to work out just how hard you can drive your recorder is to incrementally increase the record level until the onset of digital distortion, subtract, say, 5 or 10 dB, and never exceed that level. Engage "peak hold" on your recorder before recording if you want to confirm that you haven't.

When recording to analogue, the tape machine's VU meters should show around +3 dB on bass, but only around -10 dB for hi hat. Although analogue distortion is more like compression at modest overload levels (often desirable on bottom end), higher frequencies cause saturation even at modest levels (an unpleasant "crunchiness"). Also, VU meters tend to progressively under-read above 1 kHz, due to their sluggish response time. Hi hats should read about -10 dB on a VU meter, as against 0 dB for a typical snare drum, and +3 dB or more for a kick drum.

☞ **Peak meters read more-or-less independent of frequency. Aim for 0 dB recording level for all signals.**

8.7 Lining Up Recorder/Sampler Inputs

Set the channel sensitivity to match the operating level of your multitrack (consult the manual, phone the manufacturer, or simply "suck & see" to find which setting works best). The sampler's variable/switchable input gain range is bound to accept -10 dBV and/or +4 dBu. There is no oscillator in the EURORACK, but you can use a simple unmodulated sustained tone from a keyboard. Choose one around 1 kHz. Set the channel EQ to normal (12-o-clock), and line up the channel according to the setting up procedures (8.2). Route this signal to all subgroups and adjust the subgroup output faders so that the bargraph meters read 0 dB. Now put the recorder into input mode on all channels, and the sampler into sample mode. If the tape operating level switches are correctly set, then 0 dB on the group output meters should also show 0 dB on the tape recorder's input meters. A discrepancy of 12 dB indicates that a wrong operating level has been selected. Now adjust the sampler's input level until it also reads 0 dB.

☞ **Beware of inaccurafe/uncalibrated sampler input meters. Work out how hard you can safely drive the sampler's input, reference this to 0 dB on your EURORACK group (PFL). Then take note of the sampler's input gain pot setting. (Or use soft adhesive tape etc. to hold it in one position). Now you can use the subgroup meters to confirm level when sampling, usually far clearer than using the sampler's own input level display.**

8.8 Auditioning a Mix

In order to be heard other than when Solo/PFL-ed, a channel must be routed to the main mix bus. This can be either from the channel routing matrix directly (S20), or via one of the subgroups (S18/19), so long as that subgroup is itself routed to the L/R bus (S35). Channels going to tape are usually monitored via tape returns. On the EURORACK this means using either input channels (stereo or mono). Stereo line inputs, or via a separate submixer (e.g. BEHRINGER ULTRALINK PRO MX 882), patched into a suitable input such as that for 2-track playback. The MAIN MIX button of channels and subgroups going to tape should be up so as to avoid "double" auditioning.

8.9 Track Sheet

When laying out channels for recording or mixing, try to be sensible. Keep tom-toms together, etc. Work out a scheme that suits you and stick to it. A common order is: kick drum, snare, hi-hat, tom-toms (as the audience sees the kit), cymbals (ditto), bass, guitars, keyboards, other instruments, vocals. From session to session and gig to gig you will soon know where you are without hardly ever having to look at a tracksheet.

9. APPENDIX

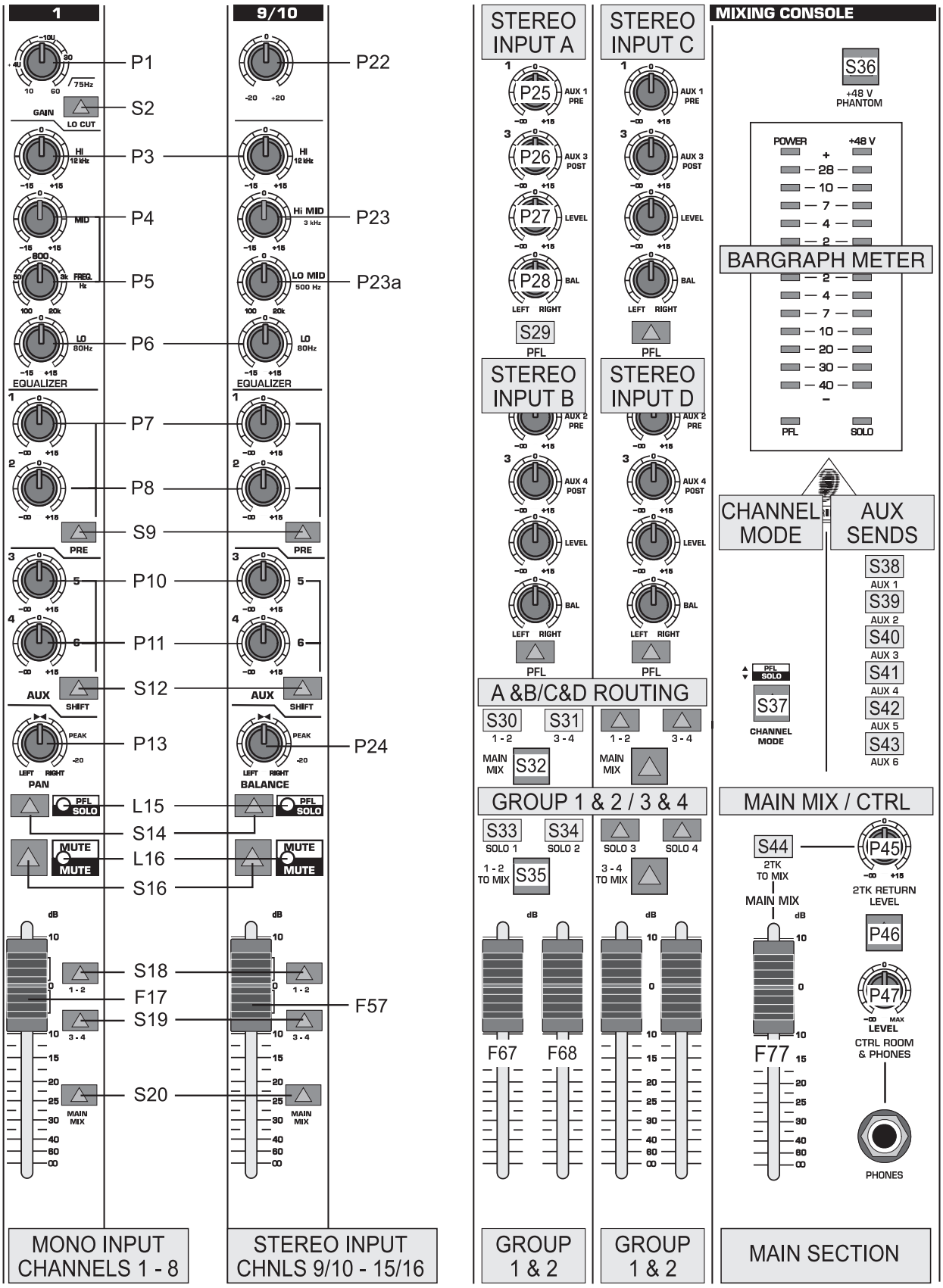

Fig. 9.1: MX2642A front view

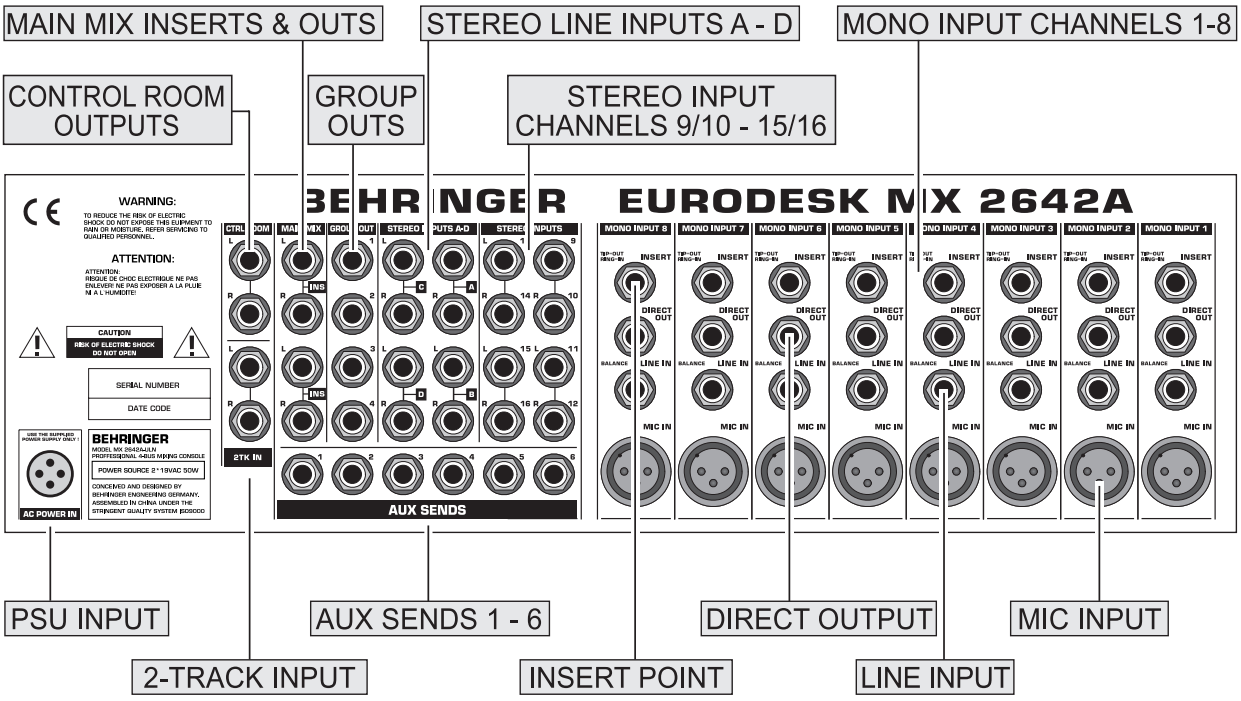

Fig. 9.2: MX2642A rear panel

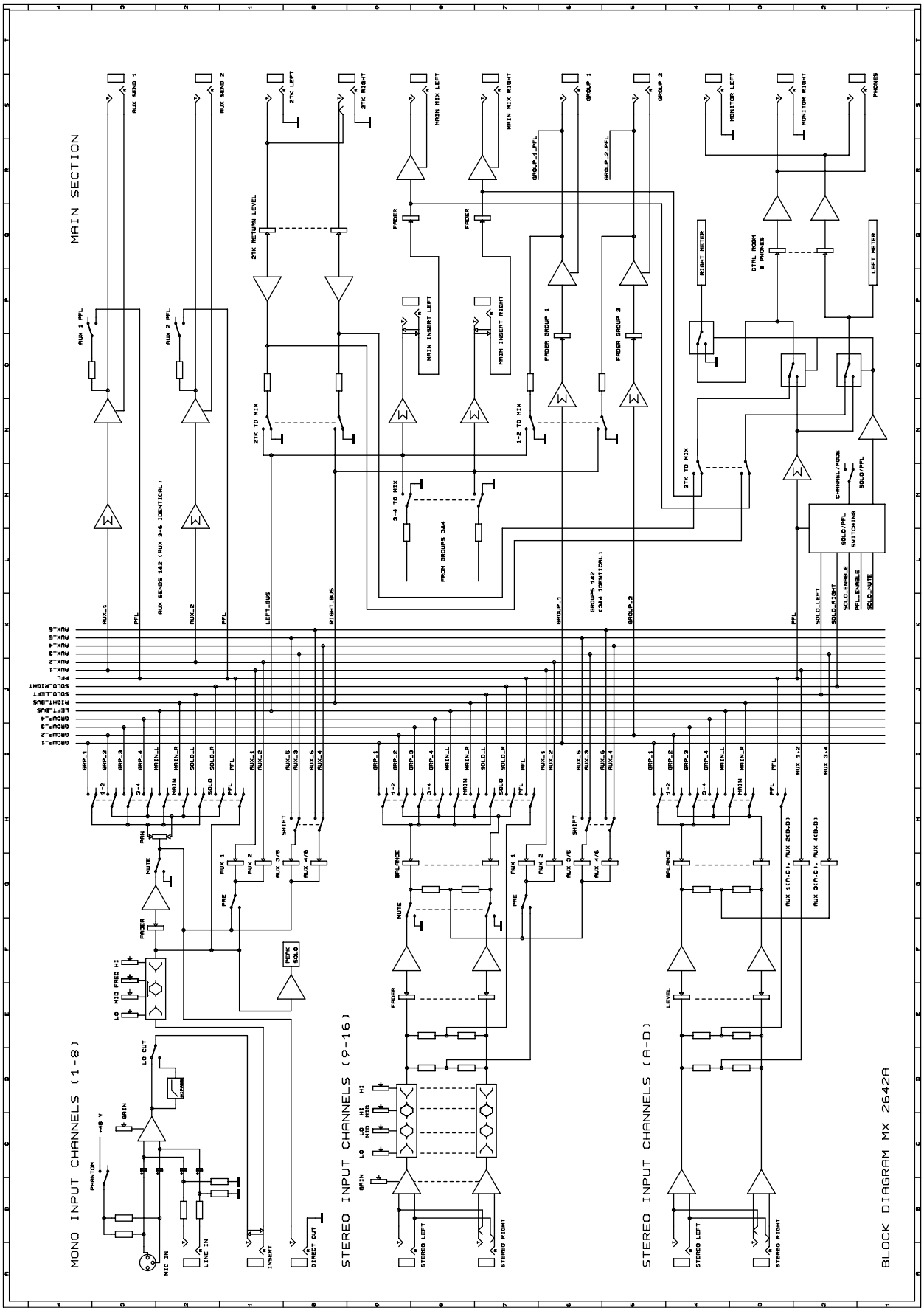

Fig. 9.3: MX2642A block diagram

10. SPECIFICATIONS

Input Channels

Mic Input	Electronically balanced, discrete input configuration
Mic E.I.N. (22 Hz - 22 kHz)	-129.0 dBu, 150 Ohm source -117.3 dBqp, 150 Ohm source -132.0 dBu, input shorted -122.0 dBqp, input shorted
Distortion (THD & N)	0.007% @ +4 dBu, 1 kHz, bandwidth 80 kHz
Gain Range	+10 dB to +50 dB
Max Input (Mic)	+12 dBu
Line Input	Electronically balanced
Gain Range	Unity to +40 dB
Max Input (Line)	+22 dBu
Channel Fader Range	+10 dB to -85 dB
Aux Send Gain Range	“Off” to Unity to +15 dB

Equalization

Hi shelving	12 kHz +/-15 dB, Q fixed at 2 oct.
Hi Mid shelving	3 kHz +/-15 dB, Q fixed at 2 oct.
Mid sweep	100 Hz - 8 kHz +/-15 dB, Q fixed at 1 oct.
Lo Mid shelving	500 Hz +/-15 dB, Q fixed at 2 oct.
Lo shelving	80 Hz +/-15 dB, Q fixed at 2 oct.
Lo Cut (High Pass) filter	75 Hz, 18 dB/oct.

Channel Direct Out

Max Output	+22 dBu
Noise @ Unity Gain	-94 dBu
Output Impedance	120 Ohm

Channel Insert

Max In / Out	+22 dBu
Channel to Channel Crosstalk	-95 dB @ 1 kHz

Subgroup Section

Noise	Bus noise @ fader 0 dB: -102.5 dBr (ref.: +4 dBu); -92.5 dBr (ref.: +4 dBu, all channels assigned and set @ Unity Gain)
Submaster Output Max Out	+22 dBu balanced/unbalanced
Fader Range	+10 dB to -85 dB/“off”

Main Mix Section

Noise	Bus noise @ fader 0 dB: -101.0 dBr (ref.: +4 dBu); -92.5 dBr (ref.: +4 dBu, all channels assigned and set @ Unity Gain)
Max Output	+28 dBu balanced, +22 dBu unbalanced
Aux Returns Gain Range	“off” to Unity to +20 dB
Aux Sends Max Out	+22 dBu

General

Distortion (THD & N)	0.007 %, @ +4 dBu, 1 kHz, Bandwidth 80 kHz;
Frequency Response	20 Hz - 40 kHz, +/- 1 dB any input to any output: 10 Hz -120 kHz +/- 3 dB

Physical

Dimensions (H * W * D)	ca. 2 3/8" / 6" (61/152.4 mm) x 17 1/8" / 19" (435.6/482.6 mm) x 14" (355.6 mm)
Net weight	7.5 kg

BEHRINGER is constantly striving to maintain the highest professional standards. As a result of these efforts, modifications may be made from time to time to existing products without prior notice. Specifications and appearance may differ from those listed or shown.

11. WARRANTY

§ 1 WARRANTY CARD/ONLINE REGISTRATION

To be protected by the extended warranty, the buyer must complete and return the enclosed warranty card within 14 days of the date of purchase to BEHRINGER Spezielle Studiotechnik GmbH, in accordance with the conditions stipulated in § 3. Failure to return the card in due time (date as per postmark) will void any extended warranty claims.

Based on the conditions herein, the buyer may also choose to use the online registration option via the Internet (www.behringer.com or www.behringer.de).

§ 2 WARRANTY

1. BEHRINGER (BEHRINGER Spezielle Studiotechnik GmbH including all BEHRINGER subsidiaries listed on the enclosed page, except BEHRINGER Japan) warrants the mechanical and electronic components of this product to be free of defects in material and workmanship for a period of one (1) year from the original date of purchase, in accordance with the warranty regulations described below. If the product shows any defects within the specified warranty period that are not due to normal wear and tear and/or improper handling by the user, BEHRINGER shall, at its sole discretion, either repair or replace the product.

2. If the warranty claim proves to be justified, the product will be returned to the user freight prepaid.

3. Warranty claims other than those indicated above are expressly excluded.

§ 3 RETURN AUTHORIZATION NUMBER

1. To obtain warranty service, the buyer (or his authorized dealer) must call BEHRINGER (see enclosed list) during normal business hours **BEFORE** returning the product. All inquiries must be accompanied by a description of the problem. BEHRINGER will then issue a return authorization number.

2. Subsequently, the product must be returned in its original shipping carton, together with the return authorization number to the address indicated by BEHRINGER.

3. Shipments without freight prepaid will not be accepted.

§ 4 WARRANTY REGULATIONS

1. Warranty services will be furnished only if the product is accompanied by a copy of the original retail dealer's invoice. Any product deemed eligible for repair or replacement by BEHRINGER under the terms of this warranty will be repaired or replaced within 30 days of receipt of the product at BEHRINGER.

2. If the product needs to be modified or adapted in order to comply with applicable technical or safety standards on a national or local level, in any country which is not the country for which the product was originally developed and manufactured, this modification/adaptation shall not be considered a defect in materials or workmanship. The warranty does not cover any such modification/adaptation, irrespective of whether it was carried out properly or not. Under the terms of this warranty, BEHRINGER shall not be held responsible for any cost resulting from such a modification/adaptation.

3. Free inspections and maintenance/repair work are expressly excluded from this warranty, in particular, if caused by improper handling of the product by the user.

This also applies to defects caused by normal wear and tear, in particular, of faders, potentiometers, keys/buttons and similar parts.

4. Damages/defects caused by the following conditions are not covered by this warranty:

- misuse, neglect or failure to operate the unit in compliance with the instructions given in BEHRINGER user or service manuals.
- connection or operation of the unit in any way that does not comply with the technical or safety regulations applicable in the country where the product is used.
- damages/defects caused by force majeure or any other condition that is beyond the control of BEHRINGER.

5. Any repair or opening of the unit carried out by unauthorized personnel (user included) will void the warranty.

6. If an inspection of the product by BEHRINGER shows that the defect in question is not covered by the warranty, the inspection costs are payable by the customer.

7. Products which do not meet the terms of this warranty will be repaired exclusively at the buyer's expense. BEHRINGER will inform the buyer of any such circumstance. If the buyer fails to submit a written repair order within 6 weeks after notification, BEHRINGER will return the unit C.O.D. with a separate invoice for freight and packing. Such costs will also be invoiced separately when the buyer has sent in a written repair order.

§ 5 WARRANTY TRANSFERABILITY

This warranty is extended exclusively to the original buyer (customer of retail dealer) and is not transferable to anyone who may subsequently purchase this product. No other person (retail dealer, etc.) shall be entitled to give any warranty promise on behalf of BEHRINGER.

§ 6 CLAIM FOR DAMAGES

Failure of BEHRINGER to provide proper warranty service shall not entitle the buyer to claim (consequential) damages. In no event shall the liability of BEHRINGER exceed the invoiced value of the product.

§ 7 OTHER WARRANTY RIGHTS AND NATIONAL LAW

1. This warranty does not exclude or limit the buyer's statutory rights provided by national law, in particular, any such rights against the seller that arise from a legally effective purchase contract.

2. The warranty regulations mentioned herein are applicable unless they constitute an infringement of national warranty law.

BEHRINGER Spezielle Studiotechnik GmbH, Hanns-Martin-Schleyer-Str. 36-38, 47877 Willich-Münchheide II, Germany
Tel. +49 (0) 21 54 / 92 06-0, Fax +49 (0) 21 54 / 92 06-30